Feb. 25, 1941. N. S. WELK 2,233,154

SPRING ACTUATED COUNTING MACHINE

Filed June 27, 1940

Fig. 1.

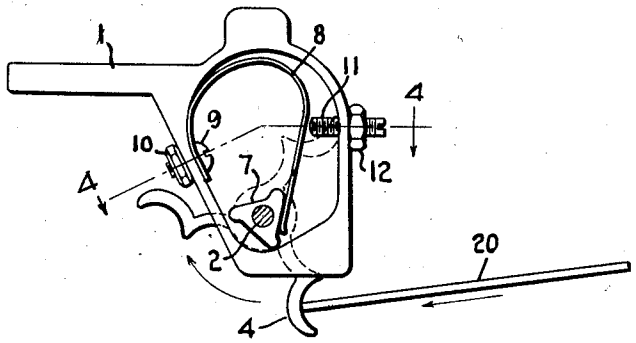


Fig. 2.

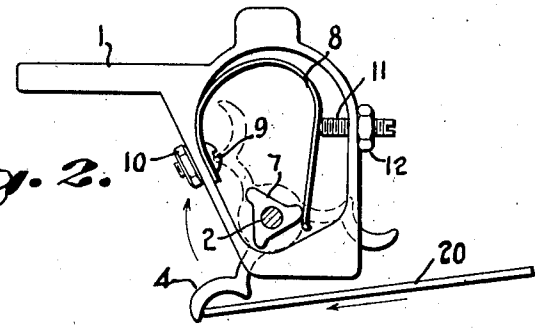
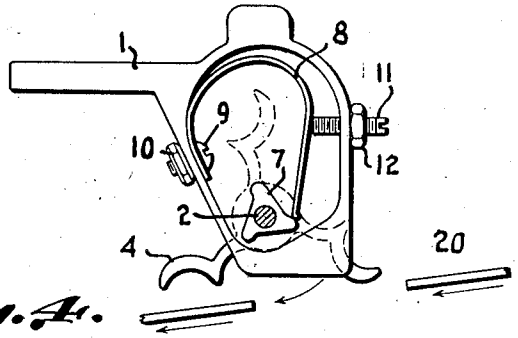


Fig. 3.



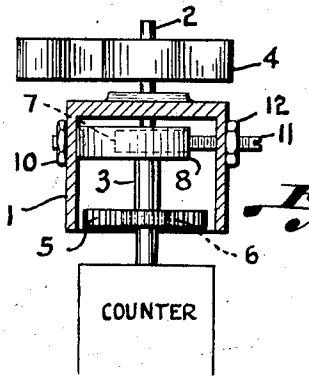


Fig. 4.

INVENTOR
NELSON S. WELK
BY Harry Lea Dodson.
ATTORNEY

Patented Feb. 25, 1941 2,233,154

UNITED STATES PATENT OFFICE

2,233,154

SPRING ACTUATED COUNTING MACHINE

Nelson S. Welk, Athens, Ohio, assignor to The McBee Company, Athens, Ohio, a corporation of Ohio

Application June 27, 1940, Serial No. 342,610

3 Claims. (Cl. 235—131)

My invention relates to devices to count cards and other sheet material such as checks, loose leaves, records, etc. of this kind as described in my copending application, Serial No. 286,570. As described in that application, the cards are fed from a stack by means of a feed roller which passes the lower card of the stack beneath a caliper where it is received by a pair of wringer rolls which drives it against the blades of one of a plurality of arms attached to the shaft of an ordinary standard commercial counter.

As further described in the specification of that application, this device is referred to as a paddle wheel and consists of three radially extending arms. These counting devices are well known in the art and usually comprise a container or housing in which is a set of wheels bearing numbers on their periphery, such as are ordinarily employed in adding machines. These wheels are each provided with ten digits and the units wheel which indexes nine times, and then after the tenth indexing, engages with the tens wheel which indexes one. It is well understood that the number of wheels employed depends entirely upon the total number to be registered and totalled.

I have found by experience that in operating these counting devices where light weight sheet material is used, and the wringer rolls project it against the actuating paddle, that the paper is not sufficiently strong to rotate the operating paddle wheel or radial arm. I have also found in practice that this is especially true, not only when counting thin cards or sheet materials, such as bank checks, but when heavier cards are provided with perforated or slotted margins, such as described in the well known Perkins Patent No. 1,544,172, they are equally liable to crumple up or else rotate the paddle wheel insufficiently to register a count.

When one is using a heavier card to be counted, it frequently occurs that the impact against the radial arm will be so great as to cause it to turn more than the desired amount to move one digit. It is therefore found that it is important that the radial arms be retained in their inert position between counting, that is between the register of one digit on the start of the wheel to index the next or following digit. It has also been found in practice that the resistance offered with the paddle or radial arm used on the shaft of the counter, is too great to assure accurate counting.

My invention has for its principal object to provide means which will assist the rotation of the radial arms, but which will also retain it in its inert or dead position, then furnish a pressure which will positively rotate the shaft until it again reaches its inert position.

Partly my invention consists of providing, in a counting machine, having a counting mechanism and a plurality of radially projecting arms, on an actuating shaft, which are adapted to be engaged by the edge of a card during its passage through the machine, means which will at first exert a slight pressure to cohibit the movement of the shaft, then produce a very strong pressure to cause its rotation.

As described in the application hereinbefore referred to, and as illustrated in the drawing herein, I have shown three radially projecting arms forming the paddle wheel, that is because in a high speed machine, the time element, which would be required for the complete rotation of a single blade, would slow up the operation of the machine, though there may be many instances where a greater or less number of blades than as illustrated may be employed.

A further object of my invention is to provide an auxiliary fulcrum for the spring which will be in operation only at the time when the spring should exert its stiffest tension.

A further object is to provide means for adjusting this auxiliary fulcrum so as to compensate for various sizes of springs or accommodate different kinds of cards.

My means of accomplishing the foregoing objects may be more readily understood by having reference to the accompanying drawing which is hereunto annexed and is a part of this specification, in which:

Fig. 1 is a side diagrammatic detail view showing the shaft of a counting machine equipped with radially projecting arms or a paddle wheel, my improved invention being shown arranged to function as hereinbefore described;

Fig. 2 is a similar view showing the spring at dead center;

Fig. 3 shows the spring having passed that center, the auxiliary fulcrum being in operation; and

Fig. 4 is a partial top or plan view of the details hereinbefore illustrated with the housing shown in section, taken on the line 4—4 in Fig. 1 in the direction shown by the arrows. Similar reference numerals refer to similar parts throughout the entire description.

As shown in the drawing, a fragmentary portion 1 of the housing or frame commonly furnished with counting devices of the character

described is shown with shaft 2, which has a bearing in the housing 1, the other end is supported in a portion of the housing (not shown). The shaft 2 is equipped with three radially projecting arms 4. As previously explained, though illustrated as three, obviously any desired number may be employed.

Above shaft 2 is an auxiliary shaft 3 better seen in Fig. 4. This shaft carries the number dials. Inasmuch as they form no part of my invention and are well understood by persons skilled in the art, no illustration or description of them is furnished other than the diagrammatic showing in Fig. 4. The shaft 3 is driven by a gear wheel 5 which is in mesh with a second or driving gear 6 which is mounted on the shaft 2.

Fixedly attached to the shaft 2 is a cam 7 which may be secured in any suitable or desired means to the shaft. If desired, it may be cut from a single piece of metal. As shown, this cam is provided with the same number of high spots as the number of radial arms.

My means of retaining it in inert position is my improved spring 8. One end of this spring 8 is attached to the frame in any suitable manner. As illustrated it is secured by means of a bolt 9 and nut 10. The purpose of spring 8 is to hold the cam 7 in the position as illustrated in Fig. 1, where part of the radial arm of the paddle wheel 4 is in position to be struck by the edge of the card or other sheet material 20 which is being fed through the counting machine (not shown).

When card 20 is projected by the feeding mechanism, against the blade of the paddle wheel, as shown in Fig. 1, it will strike with some force and this is resisted by the light pressure of the spring 8 which, in this position, is a long and flexible spring. After the inertia has been overcome, the paddle wheel 4 would be revolved almost entirely by the force thus imparted since only the light resistance of the spring opposes it. The spring will continue to exert a light pressure until the cam reaches the position clearly shown in Fig. 2. It will be clear from an inspection of this figure, that at this point the spring will be brought into contact with an auxiliary fulcrum 11 which is mounted in the casing and is secured in place by means of a lock nut 12.

It will be clear that at this point, the card 20 is still in contact with the blade of the paddle wheel 4 and further movement will cause the cam 7 to pass beyond dead center then the stiff pressure of the spring will force it around and complete the rotation of the shaft 2 without any further resistance from the moving card 20. This brings the cam into the position shown in Fig. 1 when the end of the spring (which is now a light spring) will hold the cam in its inert position.

As illustrated, the spring 8 is shown with a semi-circular portion, one end of which is secured to the housing or frame 1, the other and free end being extended approximately at a tangent to the said circle and arranged to contact the cam as illustrated and described. Although I have shown a specific configuration for this spring, it will be apparent to persons skilled in the art that the configuration may be changed without deviating in any way from the spirit of my invention, therefore, I do not desire to be limited to the specific structure illustrated or described herein except as such limitations may appear in the hereinafter appended claims.

Having described my invention what I regard as new and desire to secure by Letters Patent is:

1. In a counting machine, a rotatably mounted shaft, a plurality of radial arms extending from said shaft for sequential projection into the path of movement of material to be counted, a plurality of spring seats carried by said shaft corresponding in number to said arms, a leaf spring having a free end adapted for sequential engagement with said seats, and means engaging an intermediate portion of said spring only when the free end thereof engages a portion of the cam surrounding a point between said spring seats.

2. In a counting machine, a frame, a shaft mounted in said frame, a plurality of radial arms on said shaft adapted to be engaged by cards during their movements through said machine, and spring means cooperating with a part fixed on said shaft to exert a pressure to cohibit excess rotation of said shaft and means cooperating with said spring means to vary the effective length thereof to stiffen the same to assist in turning the shaft.

3. In a counting machine, a frame, a rotatable shaft mounted in said frame, said shaft having a plurality of radial arms mounted thereon adapted to be operated by the material to be counted, a cam fixedly mounted on said shaft having a plurality of high points corresponding in number to the radial arms and having flat seats intermediate the high points, a substantially C-shaped leaf spring one end of which is attached to said frame in the plane of said cam and the other end of which normally is flat against one of said seats on said cam, and means mounted in said frame adapted to engage an intermediate portion of said spring to stiffen it only when that portion of the cam surrounding its highest point bears against said spring.

NELSON S. WELK.